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Tree Borers and Their Control

By

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CORVALLIS, OREGON

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Tree Borers and Their Control

By

A. L. LOVETT

Borers are of common occurrence in orchards, attacking all varieties of trees. The present circular deals with borers of orchard trees in general, except the well known and seriously injurious Western Peach and Prune Root-borer*.

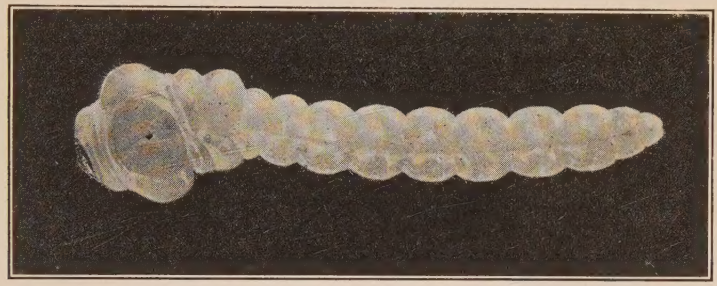

Fig. 1. Typical flat-headed borer larva showing general appearance.

Of the fruit tree borers in general, as considered in this circular, it may be stated that *they attack successfully only injured or devitalized trees.* Or to state it another way, it is only trees that have been injured or devitalized that are attacked by borers; there must be some primary cause for the poor condition of the trees, borer attack being secondary. (This statement, however, does not hold true for the Peach and Prune Root-borer.) The primary devitalization of the tree may be due to one of several causes: winter injury, poor drainage, drouth, sun scald, wrong cultural practices, injury from cultural tools, or, in young trees, failure to get well established and vigorously growing the first season. This point of primary devitalization is a very important one in any consideration of borer injury. Prevent or remove the primary devitalizing factor or factors and borers are not a problem. Every practice having for its object the thrift and vigor of the tree is good borer insurance. In combating borers the first and most important step is to discover the initial cause of devitalization and attempt by better cultivation, drainage, the use of fertilizer or otherwise to restore the impaired vitality.

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*The Western Peach and Prune Root-borer is treated in a separate circular. If interested in this circular send a postal card request to the Oregon Experiment Station; it is sent free to Oregon growers.

FLAT-HEADED BORERS

Description. Most noticeably injurious on young trees. The borer is found generally just beneath the bark as a slender, white, elongate grub with a broad, flattened head, tunneling out broad, flattened channels. The bark over the burrows is usually discolored and shrunken, the burrows filled with frass.

The adult is a small, flattened, brownish-green beetle, known as the metallic wood borer.

Life-history and Habits. There are two or more species of flat-headed borers common on fruit trees. The life-history and habits will vary somewhat. In general the borer spends nearly two years in the tree, changing to a beetle early in the spring of the second year.

Fig. 2. Flat-headed borer

The adult beetles are present in the orchard all summer long, from May until September, but they are most active and the majority of the eggs are laid during June and July. The beetles deposit their eggs singly on the surface of the bark, choosing preferably roughened areas or scaley bark. The southwest side of the tree seems the favorite spot, due, probably, in part to the warm sun shining on this area and in part to the tendency to sun-scald here. Leaning trees are particularly subject to attack as are young trees with but little top to shade the trunk.

The young borers upon hatching tunnel directly into the bark and proceed to feed and burrow out winding galleries, increasing in size as the larva grows. The older borers frequently tunnel directly through the heart wood, the elliptical shape of the tunnel indicating the kind of borer at work. By winter time the borers are only partly grown and remain in their tunnels until spring. The next summer, they continue to travel and mine, passing the second winter in the tree as a nearly mature borer and transforming the second spring to the beetle stage.

The Injury. All ages and varieties of fruit trees are attacked. Probably young trees are most seriously injured. Occasionally several hundred trees may be killed their first or second season, particularly where high temperatures and a prolonged drouth occurs, as in 1922, before the trees are well established. The borer attacking apple works mostly just under the bark at or above the surface of the ground. The flat-headed borer working on prune, peach, and apricot tunnels through the wood more and ranges over a greater portion of the tree, working often at and below the soil surface and even in the brace roots.

Borers can rapidly deplete and destroy a tree after once they attack it. Often trees which might easily have overcome the effects of the primary devitalization which invited the attack of borers are killed out in a very brief time by the borers.

Control must be in the nature of prevention rather than cure. Repellent washes are of value and are recommended for use particularly on young trees.

Wash No. 1. (a particularly effective wash)

Rock lime	½	bushel
Salt (rock salt)	2	quarts
Rice boiled (cook to a thin paste)	3	pounds
Casein (powdered)	2	pounds
Naphthalene flakes	2	pounds

Slake the lime in a vessel of sufficient capacity to permit adding other ingredients. Dissolve the salt in warm water and add the warm salt water and warm rice paste to the freshly slaked lime while still fairly hot. Obtain a fairly granular casein and sift slowly into the cool whitewash while stirring. Finally, sift the naphthalene through a coarse screen to remove the lumps and add while stirring. Add water to make a whitewash the consistency of paint, if wash is to be applied with brush. If to be applied as a spray thin a little more and strain carefully while filling the spray tank.

Wash No. 2. Same as No. 1 except, substitute crude carbolic acid for the naphthalene flakes. Use the crude carbolic at the rate of ½ pint to six gallons of the dilute wash.

Wash No. 3.

Quicklime	8	pounds
Casein	½	pound
Copper sulfate	¼	pound
Flake naphthalene	1	pound
Water to form a thick paint.		

Slake the lime in a fair-sized container. Dissolve the copper sulfate in a small amount of water (best to dissolve the day before needed). Add this copper sulfate solution to the slaking lime. Add the casein and naphthalene as in wash No. 1.

Preliminary to applying the wash scrape away the loose surface soil with an old hoe. The wash may then be applied with a regular whitewash brush or it may be sprayed on the tree. Where using a sprayer cut down the pressure to about 25 pounds. Apply the wash from the main crotch down to the ground, puddling the wash at the soil surface. Fifty gallons of wash will cover about 20 acres of young trees.

A barrel stave or similar protection on the southwest side of the young tree is advised. This prevents sun-scald and is therefore a protection against borers.

THE SHOT-HOLE BORER

Description. Trees devitalized, the foliage yellow. Trunk or limbs or both show holes, "shot holes," through bark and into the sap-wood. Examination of tunnels during summer reveals presence of small dark-brown beetles one-eighth inch long, blunt and rounded.

Life-history. Beetles pass the winter in their tunnels in the limbs and trunk of infested tree. Become active in late March, April, and May. Leave the tunnels and fly to other trees, burrowing into the wood of limbs and body. Eggs are deposited along the sides of the burrows; cross-tunnels are constructed and additional eggs deposited. The grubs hatch in a few days, and commence to feed on a mold or fungus growing on the walls of the tunnels. These grubs do not tunnel in or feed on the wood. They are active during May and June, transforming to beetles in July and August. The beetles remain in the tunnels until the following spring.

Fig. 3
Shot-hole borer

Injury. The injury by the shot-hole borer is due to the construction of tunnels and cross-tunnels in the tree by the adult beetles. They frequently bore through the heartwood, and on smaller trees and branches may entirely girdle the infested part. The grubs feed on a fungous growth and do not tunnel. Cherries, prunes, and pears are most seriously injured, but all common fruit trees are attacked.

Control. The shot-hole borer never attacks perfectly healthy trees. There must be some other primary or initial cause for the tree becoming devitalized. The primary trouble may be winter injury, poor drainage, drouth, root-borers, or any one or more of many troubles to which trees are subject. The initial trouble gives the tree enough of a setback to permit the formation of what is termed a "sour sap" condition. These beetles belong to a group known as Ambrosia beetles, because they feed their grubs on a fungus which they plant in the tunnels they construct. It is necessary for this "sour sap" condition to be present in order for the fungus to grow. The beetles are attracted to and attack only devitalized trees which have developed a sour sap condition.

The first step in attempting control is to determine the initial cause for the poor condition of the tree and take steps to improve it. If poor drainage, drain; if lack of cultivation, cultivate, etc.; but get the tree in a thrifty growing condition. Seriously infested trees or limbs should be cut out and burned.

For slightly infested trees or an occasional infested limb, use the following wash:

Water	3 gallons
Soft soap	1 gallon
Crude carbolic acid	½ pint

Mix and paint over infested portions during late April or May. About three applications are advised at weekly intervals. Liquid fish oil soap or other similar material may take the place of the soft soap. Use the wash with caution, do not apply in excess; do not paint over uninfested portions of the trees. The material works down the tunnels, destroying the ambrosia fungus and preventing its growing as food for the developing grubs.

BRONZE APPLE-TREE WEEVIL OF DEAD-BARK BEETLE

Description and Injury. Attacks devitalized apple and prune trees. Injury more prevalent on neglected trees. Areas of bark the size of a dollar or larger, shrunken, discolored, and dead. Closer examination shows small circular area with numerous small holes, which are egg punctures. Cutting into inner bark reveals irregular burrows and small pinkish weevil-like grubs.

Fig. 4.
Bronze apple-tree weevil

Seasonal History. Small, rather slender bronze-black snout-beetles are present on trees in late April and May. They feed rather promiscuously on the foliage and blossoms, later seeking the bark and gouging out holes for egg laying. Grubs hatch during late May, feed and tunnel more or less all summer, pass the winter in the tunnels as mature grubs; transforming to adult beetles in April.

Control. As with other borers, revitalization of the tree is the main thing. Dormant clean-up sprays of lye, lime-sulfur, or oil are of value. Cut out the infested bark and dead wood and paint over the wounds with a good tree paint such as bordeaux paste or creosote, 1 part; coal tar, 2 parts. Mix well and paint carefully to protect wood from decays.

NOTE

In reporting injury from borers, or where in doubt regarding the borer involved, if you will send specimens with your inquiry to the Oregon Experiment Station, advice can be given you more intelligently. Send specimens of wood or bark containing grubs if possible; otherwise specimens of the wood or grubs.